

INTEGRATED CIRCUIT PACKAGE WITH LOW INDUCTANCE GROUND PATH AND IMPROVED THERMAL CAPABILITY

ABSTRACT OF THE DISCLOSURE

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An integrated circuit (IC) package is described. In all package embodiments, a very low inductance ground path is provided from the on-die ground pads to the PCB ground plane. This very low inductance ground path can minimize electrical ground bounce to the point where it is no longer a significant problem. Ground path inductance is minimized by utilizing short downbond wires to a metal slug which acts as a very low inductance die attach pad (DAP). By extending the thickness of the DAP so that it protrudes below the bottom surface of the IC package, and by providing cutouts in the PCB, all IC package pins can be automatically self-aligned to their corresponding PCB "pads". Furthermore, the need for dedicated ground pins on the IC package is completely eliminated, significantly increasing the number of I/O pins available. In addition, the thickness and size of the DAP provide significant cooling capacity for the IC die. Finally, in those cases where maximum cooling capacity is needed, an external heat sink can be affixed to the exposed metal DAP, which extends through the bottom surface of the PCB.